AMENDMENTS TO THE CLAIMS

1. (Original) An apparatus for amplifying two collinearly propagating beams of monochromatic coherent radiation at optical frequencies ν_0 and ν_0', comprising:

a vessel for containing a gas and maintaining an excitation in the gas volume;

wherein intense narrow-band fluorescence is emitted from said excitation at frequencies ν_0 and ν_0' of allowed optical transitions of constituents of the gas, wherein said optical transitions share a common upper energy level and form a Λ type structure, and wherein one or both lower energy levels are populated in said gas volume, whereby monochromatic laser beams at frequencies ν_0 and ν_0' propagating collinearly through said gas volume containing vessel nonlinearly convert photons from said fluorescence into photons of said propagating beams, thus amplifying said beams.

2.The apparatus of claim 1, further comprising:

means for producing monochromatic laser beams at frequencies ν_0 and ν_0'.

3. (Original) The apparatus of claim 2, wherein the monochromatic laser beams at frequencies ν_0 and ν_0' are continuous (CW) laser beams.

4. (Original) The apparatus of claim 2, wherein the monochromatic laser beams at frequencies ν_0 and ν_0' are pulsed laser beams.

5. (Original) The apparatus of claim 2, wherein the monochromatic laser beams at frequencies ν_0 and ν_0' are laser beams are each a continuous series of Q-switched pulses.

6. (Original) The apparatus of claim 2, wherein the monochromatic laser beams at frequencies ν_0 and ν_0 ' are laser beams are each a continuous series of mode-locked-pulses.

7. (Original) The apparatus of claim 6, wherein the monochromatic laser beams at frequencies ν_0 and ν_0 ' are laser beams are each a continuous series of femtosecond pulses.

8. (Original) The apparatus of claim 2, further comprising:

reflective mirrors forming a optical cavity about the gas volume containing vessel; and

means for directing said beams to propagate collinearly in said optical laser cavity for the time required for amplification of light at frequencies ν_0 and ν_0 '.

9. (Original) The apparatus of claim 1, further comprising:

reflective mirrors forming a optical cavity about said gas volume containing vessel, wherein light at frequencies ν_0 and ν_0 ' is amplified.

10. (Presently amended) The apparatus of claim 1, wherein continuous and efficient conversion of photons of fluorescence into photons of coherent light beams at frequencies ν_0 and ν_0 ' occurs by the nonlinear process of stimulated hyper-Raman scattering (SHRS) occurring at every point within said gas volume containing vessel ~~whereat~~ wherin both said emitted fluorescence ~~intensity~~ and said two collinearly propagating beams of monochromatic coherent radiation ~~propagating light beam intensities~~ are present.

11. (Presently amended) The apparatus of claim 1, wherein ~~said~~ three specified-species levels forming a Λ-type structure with resonance frequencies at ν_0 and ν_0 ' are both hyperfine

levels of the Cs $6S_{1/2}$ ground electronic state and one hyperfine level of the Cs $6P_{1/2}$ excited electronic state.

12. (Presently amended) The apparatus of claim 1, wherein ~~said~~ three specified-species levels forming a Λ-type structure with resonance frequencies at ν_0 and ν_0' are both hyperfine levels of the $6P_{1/2}$ ground electronic state of ^{203}Tl and the F'=1 hyperfine level of the $7S_{1/2}$ excited electronic state~~ of said same thallium isotope~~.

13. (Presently amended) The apparatus of claim 1, wherein ~~said~~ three specified-species levels forming a Λ-type structure with resonance frequencies at ν_0 and ν_0' are both hyperfine levels of the $6S_{1/2}$ ground electronic state of either singly ionized ^{199}Hg or ^{201}Hg and a hyperfine level of the $6P_{1/2}$ excited electronic state ~~of the same singly ionized isotope~~ that is coupled by dipole-allowed transitions to both said lower levels.

14. (Presently amended) The apparatus of claim 1, wherein ~~said~~ three specified-species levels forming a Λ-type structure with resonance frequencies at ν_0 and ν_0' are ~~both~~ two hyperfine levels of the $5P_{3/2}$ ground electronic state of any singly ionized odd isotope of Xe and one hyperfine level of the $5S_{1/2}$ excited electronic state ~~of the same singly ionized xenon isotope~~ that is coupled by dipole-allowed transitions to both lower levels.

15. (Original) The apparatus of claim 1, further comprising a plurality of gas volume containing vessels wherein each vessel is a source emitting two output beams of highly monochromatic coherent radiation at frequencies ν_0 and ν_0'.

16. (Original) The apparatus of claim 15, wherein the output beams of each of the plurality of gas volume containing vessels are arranged as an array and directed to point in the same direction, and wherein the phase of each beam is varied to form a *phased directional array.*

17. (Original The apparatus of claim 16, further comprising a cascaded series of increasingly sized gas volume containing vessels for each beam, wherein the output of each of the plurality of sources is directed into a cascade of increasingly sized gas volume containing vessels.

18. (Original) The apparatus of claim 1, further comprising a cascaded series of increasingly sized gas volume containing vessels, wherein the amplified light at frequencies ν_0 and ν_0' is amplified in the cascade of increasingly sized gas volume containing vessels.

19. (Original) The apparatus of claim 1, wherein said gas volume containing vessel is a heat pipe discharge tube (HPDT).